

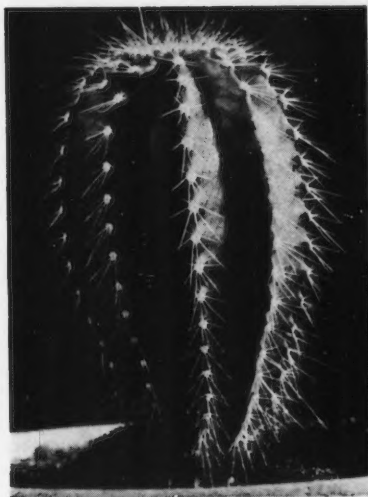
CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society
Of America

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Seedling of *Cephalocereus euphorbioides*. In older growth this Brazilian plant resembles a *Euphorbia* (see B. & R. II, page 33).



CACTUS AND SUCCULENT JOURNAL

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MARCH, 1940

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SEATTLE NOTES

Most of our club members are cactus fans, so I would suggest you have more cactus articles. For example, take the families separately: an article on *Mammillarias*, one on *Gymnocalyciums*, *Parodias*, *Astrophytums*, and *Notocactus*. These are the families we are all very much interested in.

We are also interested in travel stories from the collectors. I enjoyed the one from Schwarz and Georgi, of Mexico, very much.

How would it be to have a club page and have every club contribute a little personal note in every issue. It is always interesting to know what the other clubs are doing. Articles on wild cactus would be appreciated.

I never will forget the thrill I got when I ran on to a big hill of *Pediocactus Simpsonii* all in bloom. I had heard there were some near the Vantage Bridge, yet I could never find anyone who could tell me where they were. Anyone travelling from Yokama, in eastern Washington, to Seattle, during the month of May will see them on the north side of the highway, about one mile west of the big stone house in the Petrified Forest. The stone house is a government mark and almost everyone stops there, so they are not hard to find if one looks for the beautiful watermelon pink blossoms. There are patches of blue, lavender, white and yellow flowers like little rock gardens all along the roads, but when you see the gorgeous pink, stop and there they are.

I do hope you take this as constructive criticism. I would appreciate an article on Vitamin B, also one on "How to Root Plants." We, who do not have greenhouses or glassed-in porches, just the south exposure in our homes, have trouble rooting plants. I have thought of making a box to fit a window sill with light globes for heat; a description of such a rooting box would interest others.

I have taken the JOURNAL only one year and belonged to the club one year; I have made some grand new friends and enjoy the work and the JOURNAL more than I can tell you.

MRS. R. E. EYLER, Seattle, Wash.

FROM RED BLUFF, CALIF.

My cactus garden was under water for three days during the February flood. My heart sank when the water stayed up so long, as I was afraid that after it did go down all the plants would be gone. A number of the small ones were entirely covered with silt and sand. We took the garden hose and washed them thoroughly and, I am happy to say, that besides a few that were washed away, we lost only one.

We have since moved and with almost 200 varieties,

some of which are five and six feet tall, moving was some job. We were again afraid as some of them were beginning to bud, but only one lost the buds and did not flower. Some of the plants were out of the ground three to six weeks before we could get the garden prepared for them; in spite of this, we had many beautiful blossoms.

MRS. F. R. FALLS.

FROM OAKLAND

The Cactus and Other Succulent League with its meeting place at 5161 Trask Street in Oakland, California, is about to close a very busy and successful year with Mr. Frank Tyrrel as President, Mr. John Hastings as Secretary, and Mr. W. C. Andrews as Treasurer.

We have to our credit a Gold Medal for the exhibit of Cacti and Other Succulents including *Euphorbias* at the Golden Gate International Exposition on Treasure Island in 1939, also a Bronze Medal for the exhibit at the annual Oakland Flower Show held in May of 1940. At present the League is exhibiting at three different places at the 1940 Fair on Treasure Island; namely, at the National Garden Show, in the Hall of Flowers, and in an outdoor display. Much of our success has been due to the tireless efforts of W. C. Andrews, chairman of the show committee, and its members.

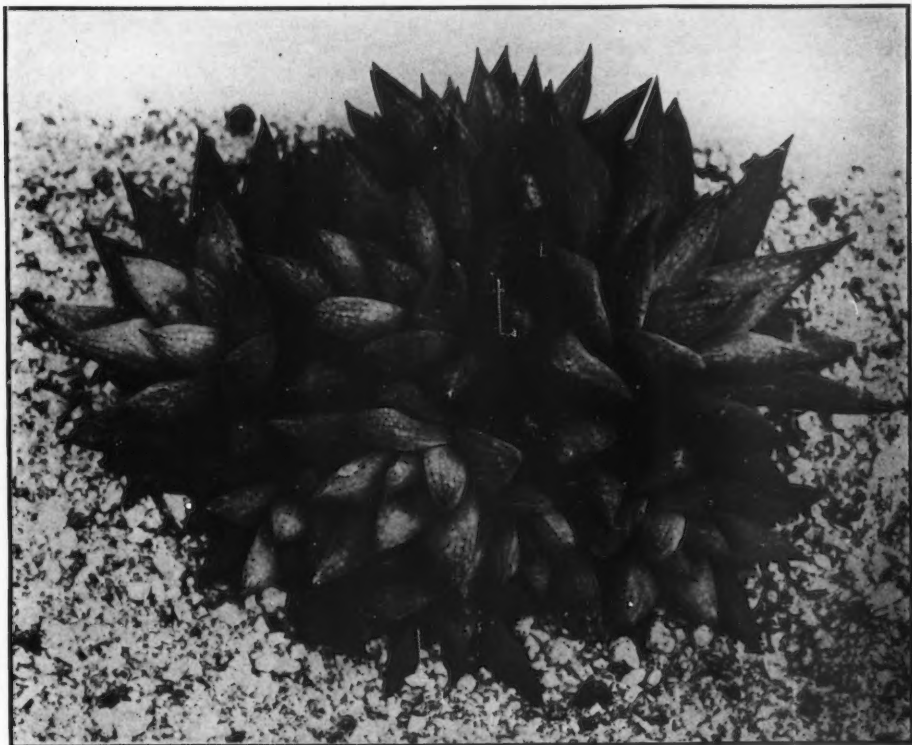
The program of the year has included talks by Professor E. O. Essig, who also showed colored slides of cacti and other succulents. Mr. Jack Whitehead of the Botanical Gardens spoke on "Collecting Plants in Lower California," and Professor H. M. Butterfield on "Echeverias;" all are from the staff of the University of California at Berkeley. Mr. G. W. Van der Bundt gave a most interesting talk on "Opuntias," as did Mr. J. L. Hastings on "Epiphyllums." Mr. W. C. Andrews discussed the "Euphorbias," and Mr. Frank Tyrrel the "Echinocactus," and at one meeting Mr. F. Radley of the Stanislaus Desert Gardens, gave an account of plant collecting in the southwestern United States. A plant exchange brought many interesting plants. Our members were most generous in releasing rather choice specimens for trade.

The summer schedule includes trips to various gardens in outlying districts, namely Livermore, Tracy, Stockton, Antioch, and Palo Alto.

We have been able to increase our library so that we now own several worthwhile and informative books, including Jacobsen's "Succulents," Britton and Rose's "The Cactaceae," and "The Stapelieae" by White and Sloane.

With so active an organization we look forward to another busy and successful year.

MRS. WILSON NEWLON, Chairman Program Com.



Haworthia Haageana Poelln. nat. size.

Notes on Haworthias

By J. R. BROWN

Haworthia Haageana Poelln. in Repert. Sp.
Nov. XXVIII (1930) 104.

Plant proliferous from the base and soon forming a dense cluster. Leaves to 4 cm. long and 15 mm. wide in the middle, smooth, pale glaucous green, with darker anastomosing lengthwise lines most pronounced in the upper part, ovate-lanceolate, attenuate, acute, somewhat turgid in the upper part, the tip slightly incurving and terminating in a very short bristle, face of leaf somewhat flat, back of leaf rounded and somewhat obliquely keeled toward the tip, the margins and keel entire or with a few inconspicuous teeth more or less irregularly distributed.



Haworthia Haageana Poelln. nat. size.

Peduncle slender, simple, 30-40 cm. long; bracts 7-9 mm. long, broadly ovate, cuspidate, membranaceous with green keels, pedicels 3-4 mm. long; perianth 15-17 mm. long, white, green lined, the obtuse, reflexed segments with pale green keels.

Locality: Vicinity of Grahamstown.

Named in honor of the firm of Fr. A. Haage, Jr., of Erfurt, Germany, the well-known dealer in succulent plants.

Haworthia Haageana belongs in the sect. *Muticæ* Berger and is one of the largest spp. of this sect., and has quite showy and conspicuous

flowers.

It is very responsive in its growth to varying conditions of light, the photo illustrating a cluster shows the plant grown under good light conditions in a greenhouse, but under more shaded conditions it may grow much larger and the leaves are quite spreading. The small photo of a single rosette shows this plant as grown in the open, when it is much smaller and quite slow growing, the leaves more erect and the color darker, the uniting lines are then quite brown and prominent and the tips of the leaves also assume a brown color.



Grafts growing on husky *Cereus* stock. Moon's Cactus Garden was one of the first to use large stock instead of *Pereskia* and *Nyctocereus*. (1) Small section of the Moon Gardens. (2) *Rebutia einsteinii*. (3) *Mammillaria* species. (4) *Rebutia miniscula*. (5) *Echinocereus knippelianus*.

CRISTATES IN THE COLLECTION OF FRANK MARK, LOS ANGELES

(Send in your additions to this list)

- ARIOCARPUS**
 retusus
APOROCACTUS
 flagelliformis
BERGEROCACTUS
 Emoryi
CEPHALOCEREUS
 alensis*
 chrysacanthus
 dautwitzii (espostoa lanata)
 dautwitzii
 (espostoa lanata variegated)
 deeringii
 nobilis
 Palmeri
 polygonus
 senilis
CHAMAECECEUS
 Silvestri
 var. crassicaulis
CHILENIA*
 acutissima*
CLEISTOCACTUS
 Baumannii
 Strausii
CORYPHANTHA
 aggregata
 echinus
 erecta
 neomexicana
 pseudechinus
ECHINOCACTUS
 Grusonii
 platensis
ECHINOCEREUS
 Baileyi
 Berlandieri
 Bonkeri*
 Boyce-Thompsonii
 Brandegeei
 caespitosus
 chloranthus
 dasyacanthus
 Ehrenbergii
 Engelmannii
 Fendleri
 Fitchii
 grandis
 maritimus
 Merkeri
 pacificus*
 pectinatus
 Reichenbachii
 rigidissimus
 Rosei
 subtereanous*
 stramineus
 triglochidiatus
ECHINOFOSSULOCACTUS
 (Stenocactus)
 hastatus
 multicostatus
 vaupelianus
ECHINOMASTUS
 intertextus
 Macdowellii
- ECHINOPSIS**
 ancistrophora
 Eyriesii—also variegated
 leucantha
 multiplex
 oxygona
 rhodotricha
EPITHELANTHA
 micromeris
ESCOBARIA
 chihuahuensis
 dasyacantha
FEROCACTUS
 acanthodes
 haematacanthus
FRAILEA
 cataphracta
GYMNOCALYCIUM
 mazanense
 Mihanovichii
 Pflanzii
 quehlianum
 saglionis
HICKENIA
 microsperma
LEMAIREOCEREUS
 hollianus
 hystrix
 stellatus
 Thurberi
LOBIVIA
 aurea
 lateritia
 Pentlandii
 Pentlandii variegated*
LOPHOPHORA
 Lewinii
 Williamsii
 Zeigleri
MACHAEROCEREUS
 gummosus
MAMMILLARIA
 angularis
 bocasana
 celsiana
 celcianus*
 chionocephala
 compressa
 dioica
 echinaria*
 elegans
 elongata
 Fischerii
 fragilis
 geminispina
 gigantea
 gracilis
 guelzowiana
 hahniana
 hidalgensis
 insularis*
 karwinskiana
 kewensis*
 magnimamma
 microheliopsis
 Milleri*
 nivosa
- MAMMILLARIAS—Continued**
 Painteri
 Palmeri*
 Parkinsonii
 perbella
 perbella-fina*
 plumosa
 pseudoperbella
 rhodantha-rubra
 rhodanthar-sulphurea
 schiedeana
 spinosissima
 Wagneriana*
 Wildii
 Wrightii
 Zeilmanniana
NEOLLOYDIA
 conoidea
 grandiflora
 horripila
 texensis*
NEOPORTERIA
 Reichei
NOTOCACTUS
 concinnus
 Grossei
 Haselbergii
 Leninghausii
 mammulosus
 muricatus
 Ottonis
 ruberrima (red)
 candida (white)
 tabularis
NYCTOCEREUS
 serpentinus
OPUNTIA
 clavarioides
 floccosa
 vestita
PACHYCECEUS
 marginatus
 Pringlei*
PARODIA
 aureispina
 microthele*
 mutabilis
PELECYPHORA
 pseudopectinata
PHELLOSPERMA
 tetrancistra
REBUTIA
 minuscula
SOLISIA
 pectinata
STROMBOCACTUS
 disciformis
 turbiniformis
THELOCACTUS
 bicolor
 var. bolanensis
TRICHOCECEUS
 Bridgesii
 candicans
 Schickendantzii
 spachianus
 thelegonus

Cacti--Hybrid, Grafted and Monstrous

By MRS. J. RUSSELL

From The Cactus Journal of Great Britain

To start with the normal cactus—we have here merely a straightforward flowering plant with a root, stem and leaves, as natural as a buttercup. But, while the buttercup has two kinds of leaves, the green leaves and the floral leaves, among cacti the former are nearly always missing or reduced, their part in assimilation and transpiration being taken by the stem which is modified into an almost infinite variety of forms. Strange to say, among cacti, there is no great diversity in the form of the flowers and, though we have the short, rather papery blooms of the mammillarias, the fleshy flowers of the gymnocalycium with their large smooth scales, the beautiful trumpets of the echinopses with the scales reduced to hairs, the hose-in-hose effect of *zygocactus* and *ariocarpus*, yet the flowers differ very little from one another in structure, and it is these flowers, and these flowers alone, which make a cactus a cactus and differentiate it from all other flowering plants. There is a great range of colour in the flowers, but no blue and no mauve or violet shades, but there are tones in the yellow to red range which probably occur nowhere else. There are also some remarkable "off-whites" and greens.

Now to deal with the hybrids. Why do you want hybrid cacti?

The two main excuses of horticulturists for hybridisation are, first, to improve the constitution of a wild plant which is not quite thrifty in our gardens, particularly in our rock gardens, and secondly, to enlarge the flowers and improve their colour. But neither of these excuses can hold good for cacti. They are with few exceptions reasonably hardy if given a fair chance, and as for size and colour of the flowers, all I can say is, look at your own collection now in bloom and try to think if you could better the colour. And some of the night-flowering cerei have flowers fourteen inches across.

The number of species of cacti is about 1,500, sub-varieties often classified as different species bring this to nearly 4,000. Are these not enough? Or do you wish to add to the number by making new hybrids? All hybrids are not unnatural; a certain number do occur in nature, for instance, even collected plants of *Astrophytum myriostigma* are frequently spiney hybrids and not the true spineless type, and seedlings from these will generally show a proportion of plants true to type. This natural hybridisation is not uncommon in areas which are cut off and isolated by physical conditions, particularly in valleys separated by barren rock or glacier, or on islands; under the same conditions local varieties in the same species sometimes occur, and the cactus specialists, with their usual enthusiasm, have made sub-species and species of what among other flowering plants would have merely been noted as varieties.

Some of the oldest known cacti in this country are the phyllocacti, epiphyllums and certain easy-flowering echinopses. They have survived the overwatering and overheating of the Victorian hot house and conservatory, lived in cottage parlours during the period when the cactus was in eclipse, and their cuttings and offsets, actually parts of the same plants which were thriving in this country a hundred years ago, are once more re-

stored to honour in our cactus houses. These plants are nearly all hybrids, so perhaps on the score of hardiness we should allow the hybrid cactus a place.

But the point I wish to emphasise most is this; our cactus houses are a sanctuary where many very rare cacti have a home, safe from disaster of fire and earthquake, safe from the spread of civilization which has put an end to so many natural species all the world over; and, if we take more interest in the hybrid than in the true species, so we run the risk of losing these natural species and, once lost to the world, they can never be replaced. Some species of wattle or mimosa have been destroyed by fire in Australia within living memory, and now only exist in botanical gardens and private collections. Be content with natural species. Don't worry if the fine blooms of *Gymnocalycium venturianum* are a dirty white and, if the hybridist offers you a nice *Gymnocalycium venturianum* hybrid with pink flowers instead of dirty white, have nothing to do with him and be content, for you have the real thing, the other is a fake.

Next, we come to grafts. What are the advantages of grafts?

The best-known grafted plants are our ordinary fruit trees and roses. The latter (not strictly grafts but produced by the similar process of budding) are claimed to be harder than roses on their own roots. Anyone who has grown roses from cuttings knows that there is little foundation for this claim, though the grafted plants do bloom sooner than those on their own roots. But the chief reason for them is that a number of plants of a new variety can be rapidly produced and sold. Apples and pears cannot be grown from cuttings, so must be grafted on suitable stocks. Again, as for roses, numerous scions can be cut from one new seedling variety. In our flower gardens the chief aim of grafting seems to be to turn into trees plants which nature intended for shrubs, and so we get such monstrosities as brooms grafted on to laburnum stocks.

Let us turn to cacti and see what the advantages and disadvantages are. First, certain imported cacti can only be induced with difficulty to make new roots when replanted, some do not root at all, for instance, *Peniocereus Greggii*, *Opuntia clavarioides*. Secondly, many trailing or slender-jointed species must be grown in hanging pots if they are to be on their own roots. The growers of grafted *zygocacti* claim that these make better plants on *cereus* or *pereskia* stocks; nevertheless, if they are rooted from a good straight joint they make fine bushy plants, and the largest *zygocactus* I have ever seen, which lived in a hotel window north of the Arctic Circle and measured over four feet across, was on its own roots, and the lower part of the stem had become so fibrous and rigid as to form an almost tree-like trunk. *Aporocactus flagelliformis*, on its own roots, has the advantage that branches over two years old, which are generally becoming brown and unsightly, can be cut away to the ground without disfiguring the plant. As the "tails" grow as much as three feet long, a suitable stock might be a little difficult to find.

Thirdly, it is sometimes objected that *rebutias* flower too close to the ground, and that a short stem raises them sufficiently for the blooms to show at their best;

but if they are grown on their own roots in a wide-topped pan with plenty of gritty top dressing, what can be neater than a squat little *Rebutia* with its ring of brightly coloured flowers rising from the level of the ground and almost covering over the body of the plant. Grafting is also used as a means of propagating cristates and similar deformities, but of this I shall speak later. These do not usually flower, and if an one wants these pathological specimens some means must be found of reproducing them artificially.

Apart from the fact that grafts are unnatural, there seems some danger that the stock must affect the form of the scion; for instance, fleshy, quick-growing cerei are bound to affect the form of the plants grafted on them. Some of you will no doubt arise indignantly against me when I say this, but I have never seen a grafted *Rebutia* which had the neat, compact form of a seedling or offset. My own *Rebutia Marsoneri* had forty-two flowers on a single-headed plant this year, on its own roots; could a graft have done better? I have even heard it claimed as an advantage for grafts that "they make finer and larger plants." If it is in the nature of a plant to measure two inches across and one and a half inches in height, why rejoice because you have a bloated specimen which is four inches high and three inches wide?

Prof. Borg, in his book *Cacti*, makes the following remark (p. 38): "Continental nurserymen very generally graft species of *Zygocactus*, *Schlumbergera* and *Rhipsalidopsis* on rooted cuttings of *Peireskia grandiflora* and *P. aculeata*. However, experience has shown that in Southern Europe and also in the Maltese Islands, these grafts on *Peireskia*, though they unite well, never thrive properly and never grow into such magnificent specimens, producing annually several hundreds of flowers, as they do when grafted on *Selenicereus Macdonaldiae* or on *Cereus triangularis*." This certainly suggests that the choice of stock influences the plant resulting from the graft; which will not surprise anyone who is growing modern fruit trees. One of the best instances is the well-known apple "Lane's Prince Albert"; early grafts of this were made, I believe, on the native Hertfordshire crab, and it got a bad reputation as an orchard tree for its unmanageable, twisting and straggling growth; this growth was apparently acquired from the crab stock. Now, on a modern dwarfing stock, it makes a neat little tree, erring if anything on the size of compactness.

It is just in the fact that a more succulent and vigorous stock will give strength to a cactus of weak growth that the danger lies, and, if your cacti are to remain natural rather than monstrous cacti, grafts should only be admitted to a collection when all other means of producing a natural plant of the required cactus have failed. The last word has not yet been said on "bad rooters," and so long as you take the easy way out by grafting you will not discover a method of rooting them.

Last of all I will speak against monstrous cacti. Until recently the chief of these were cristates and many-headed plants, but unfortunately a new horror has come to us (I believe from Northern Europe) in the form of the variegated cactus. In the past it was the custom of the wealthy to collect abnormal and deformed human beings; and kings and noblemen treasured these unfortunates as rare and valuable possessions. Until a few years ago travelling shows exhibited to the simple countryman two-headed calves and four-legged chickens, to say nothing of the fat women and living skeletons. While we are sufficiently enlightened to turn away from such horrors, some of us still delight in diseased and deformed plants. Variegated plants have their admirers, although variegation is frequently the

result of virus disease and, as such, highly contagious. I have known the variegation of the golden or white streak type spread from a hedge to other trees in a shrubbery, and it is possible to infect a whole plantation of naturalised tulips by introducing a few of the streaked "bijbloemen." There are also a number of variegated cacti, mostly *Chamaecereus Sylvestrii*; these are pale yellow, grafted on a streaked or green cereus stock. Now what interest could these have to a health-minded collector of cacti? Their place is in a pathological museum. There are few more charming cacti than *Chamaecereus Sylvestrii* with its neat reddish-green joints bearing large scarlet flowers, and flowering at intervals for three months of the summer, and rooting so easily that joints knocked off root themselves at any angle on the surface of the pot. So, as an improvement, we are offered chlorotic growth, without flowers, grafted.

Next, come many-headed plants, and to what extent these are abnormal is hard to say. Succulents (including cacti) are by their nature plants which have adapted themselves to unnatural conditions—conditions which are so hard as to make it impossible for plants not so adapted to live. Even in our gardens, abnormalities such as hen-and-chicken flowers, fasciated stems and so on nearly always occur after long periods of drought; they were, for instance, very prevalent in the summer of 1938, so it is not surprising that some cacti should show so many deviations from normal cactus growth.

Double heads are extremely common in mammillarias. Some of these start immediately after the cotyledon stage, and two growing points instead of one are formed, so that in a very short time we have a double-headed plant with two perfect globular stems on one root. As far as I know these produce normal seedlings, but it would require controlled experiment over several generations to prove whether this abnormality could be inherited or not. Some mammillarias do not split until about the second year of growth from the seedling stage. They never make two perfect heads, but remain forever as a siamese twin, though otherwise they grow and flower normally. *M. Parkinsonii* and *longicoma*, among others, are bad offenders in this respect. Grouped clusters are probably a normal method of vegetative production in certain species and under certain conditions; but in some cases offsetting from the base of the plant seems to be the result of a check in growth, and is therefore, to some extent, an abnormality. Last year (1938) I took one out of a batch of *Rebutia minuscula* seedlings just coming into flower bud, and repotted it to give away, promising the recipient that "if it doesn't flower this year, it will next." It dropped its buds, and this year, instead of flowering, it has produced a ring of offsets. It has been treated exactly like the others out of the same batch, and all these have flowered normally. Was this change to vegetative production by offsets the result of a check growth? I have had the same experience with *Dolichobele longimamma*.

When it comes to cristates, which are much sought after by many cactus fanciers, and are a great source of profit to continental growers, I can hardly bring myself to speak calmly. To my mind they are indecent atrocities, only to be paralleled by the double-headed calf and the four-legged chicken of the country fair. They are horrible and all more or less alike, a fan or a tightly curled coxcomb crest, distorted almost out of recognition of the species, generally grafted on top of a tall column of cereus. Some of them are so ashamed of their unnatural state that, if on their own roots and growing in plenty of soil in a roomy pot, they attempt

to revert to the normal and produce non-cristate off-sets.

Cristation is a form of fasciation or the formation of numerous buds from one growing point. As I wished to have up-to-date information on the subject of fasciation, I wrote to Prof. Salisbury, Professor of Botany at London University, and received the following note: "Fasciation usually occurs when a period favourable to photosynthesis and food accumulation but unfavourable to growth is followed by conditions (e.g. increasing moisture) which favour rapid growth. The elements formed under these conditions may become mechanically fixed." So that after suffering misfortune the miserable plant may not be able to recover, but continues to distort itself until uprooted by a collector and sold to a nurseryman who, seeing in its a source of profit, cuts it into as many pieces as possible, grafts them on to cereus or, in the case of opuntias, on to opuntia stock, and sells them to be the pride of a cactus collection. Can you possibly call these things anything but monstrosities? Many cacti grow under such rigorous conditions that abnormalities and distortions occur; but the fact remains that a cactus at its best is a natural flowering plant, and disease and deformity are no more its inheritance than they are the inheritance of the child living in a damp and sunless slum cellar.

I would like to end with three quotations, the first probably familiar to you all, from Prof. Borg's *Cacti*, p. 40: "Fasciated plants often produce flowers which, however, are generally reduced in size and usually defective or malformed, and hardly ever produce fertile seed."

The second is from Forest Shreve, who is in charge of the Desert Laboratory at Tucson, Arizona, speaking of grafts and cristates: "The great vogue of cristate cacti betokens a strong collecting instinct rather than the possession of the highest aesthetic taste and the purest appreciation of nature; there is no circle of dog fanciers devoted to animals with four ears or two tails. The same love of the grotesque that has made cristates popular has also furthered the art of grafting. Both of these popular features are due to the relative newness of the cactus hobby, and it is safe to predict that they will finally pass into the same limbo of oblivion that long ago took from us our bushes trimmed to resemble dogs or birds."

And lastly, from Prof. Walter Raleigh's words against artists, which apply equally well to hybrids, grafters and makers of cristates:

"They fiddle with the works of God
And make them seem uncommon odd."

FROM BRAZIL

My father had come to Brazil a few weeks before the outbreak of hostilities in Europe and his presence here will enable me to leave for a while the business now established and to start a new collecting trip to Peru, which possibly will be extended to Ecuador and Colombia, if conditions are favorable. I hope to collect cacti and orchids for about five months in Peru, starting in July. Also seeds and other plants, bulbs, etc., will be collected.

My knowledge of that country, which I visited some years ago, will help me now in collecting not only the better-known species which exist already in American cacti collections, but it will also enable me to visit extensively in regions which hitherto have not been explored for cacti. Thus, my trip will probably produce many new species. Northern Peru, for example, is well-known to collectors. An area of 600 miles in central and southern Peru, on the other hand, is scarce-

ly known to botanists and practically unexplored by cacti specialists. A great many newly-built roads now allow easier penetration into a region which was formerly accessible only by crossing the terrific roads over the Cordillera Mountains by mules. So I have the best hope to collect and ship many new species.

After I have finished the main work of collecting in Peru, and after the shipment of tropical plants to the States will become impossible owing to frost danger, I hope to work for some weeks exclusively on writing articles on what I have seen and found in Peru. I am taking with me photographic equipment and hope to produce several hundred pictures on the way, which also will be published. I still have many photographs from my last trips into the Argentine, Bolivia, Peru, Uruguay, Paraguay and Brazil, which have not been published and I have thought to join and to publish them in a South American Cacti Album, but again the costs of reproduction would probably not be covered by the quantity of books which would be sold.

HARRY BLOSSFELD.

FLOWERING THE PEANUT CACTUS

I'm very delighted with my *Chamaecereus Sylvestrii*. Had it for years, but no flowers. Last fall before frost I potted it in a granite pan a few inches wider than the plant diameter. It had absolutely no water from the time it was potted up until I put it out, (sunk pan and all) in the ground for summer. It has bloomed profusely, is just finishing. Would like to pass this on to others who have not been able to bloom it. It did not shrivel badly; was wintered near a dining room window facing south.

A *Hamatocactus setispinus*, 2 inches across, bought this spring, has two interesting spotted buds, at this time, July 9, also buds on *Echinopsis albiflora* and another unidentified *Echinopsis* with lovely rose flowers. The hardy clumps of *Mammillarias*, native to Kansas and Nebraska, with the cerise-rose flowers, bloomed very profusely about three weeks ago. *Mammillaria prolifera* and a yellow spined one like it, bloomed and produced red seed pods throughout the year, indoors and out. *Mammillaria bocasana* has also bloomed recently on a south window sill inside. My two *Ariocarpus fissuratus* are set close up against the south side of house outside, planted in plain tin cans, and will surely put forth flowers in October, as they usually do. They get very little water in summer and almost none in winter. One is about 10 years old, I've had it that long anyway. Just a single rosette.

MRS. FORREST HUSS, Afton, Iowa.
July, 1939.

IMPORTANT NOTICE: You are advised not to sell your first ten volumes of the CACTUS JOURNAL for less than \$80. If you have been a regular subscriber for these ten years you may have paid only \$30 for these issues which have also included valuable supplements. Since the supply of JOURNALS is becoming lower each month, full sets will soon be rare and you are hereby advised as to their monetary value. As soon as the "Ten Year Cumulative Index" is completed there will be further demands for back volumes.

SCOTT E. HASELTON, Editor.

Editor's Note: See the next Journal for a report of the Sixth Annual Cactus Show of the Southwest Cactus Growers. The following 8 pages are the third installment of the monograph "Colorado Cacti."

Photograph Your Plants

By H. A. VAN COTT

Additional interest in any hobby is readily created if the hobbyist can find it possible to make permanent records of his specimens by means of photography. I know of no subject more suitable for thus recording than living plants and especially the succulents, both the cacti and the non-cacti, which lend themselves admirably to beautiful compositions.

All enthusiasts will find as the years go by, refreshing entertainment in looking over photographs of the choicer specimens of his or her endeavors in specialized horticulture, as well as in photography.

So many who have had no experience in "picture making" are inclined to look upon the process as a rather complicated scientific problem wherein a highly developed knowledge of physics, chemistry, optics and mechanics are necessary. Such is not the case, even though all the above mentioned sciences and many arts have important parts in photography they need not concern the novice, they have all been worked out and wrapped up ready for use. And judging from the parade of photographic reproductions passing before us today, one is tempted to think that the real problem is what to make a picture of rather than how to make it.

Many appear to be quite satisfied in setting a potted plant on a box, place behind it a black or a white ground and proceed to make a picture. The unsightly pot with its poorly arranged plant and unattractive background, all poorly lighted, is a sorry sight to show to a fellow hobbyist and it soon becomes tiresome to all concerned.

Only a few fundamentals are required to make the photograph far more acceptable, and it is my purpose to show in this short article the necessary photographic equipment and simple contributory items and how to use them in a manner most practical to produce photographs of which the owner can be justly proud.

In the matter of photographic equipment, the hobbyist is only restricted by finances. The more important consideration should be the adaptability of the apparatus to the work for which you intend to use it. The judging of a finished photographic print gives no indication of the cost of the equipment that produced it. Suitable equipment can be secured that will fit in with your budget.

It is essential that the camera be of the bellows type, taking a film size of no less than $2\frac{1}{4}$ inch by $3\frac{1}{4}$ inch and fitted with a ground-glass

for focusing and the best lense that you can afford. The long bellows permits the photographing of small plants, such as the Lithops, close up.

A substantial and rigid tripod, fitted if possible, with a tilting and revolving head, will save a lot of tripod adjusting. Two No. 2 Photo Flood lights with reflectors and suitable stands to carry them are necessary. A No. 1 Photo Flood light and reflector to be held in the hand during an exposure, is often a great help for special lighting effects.

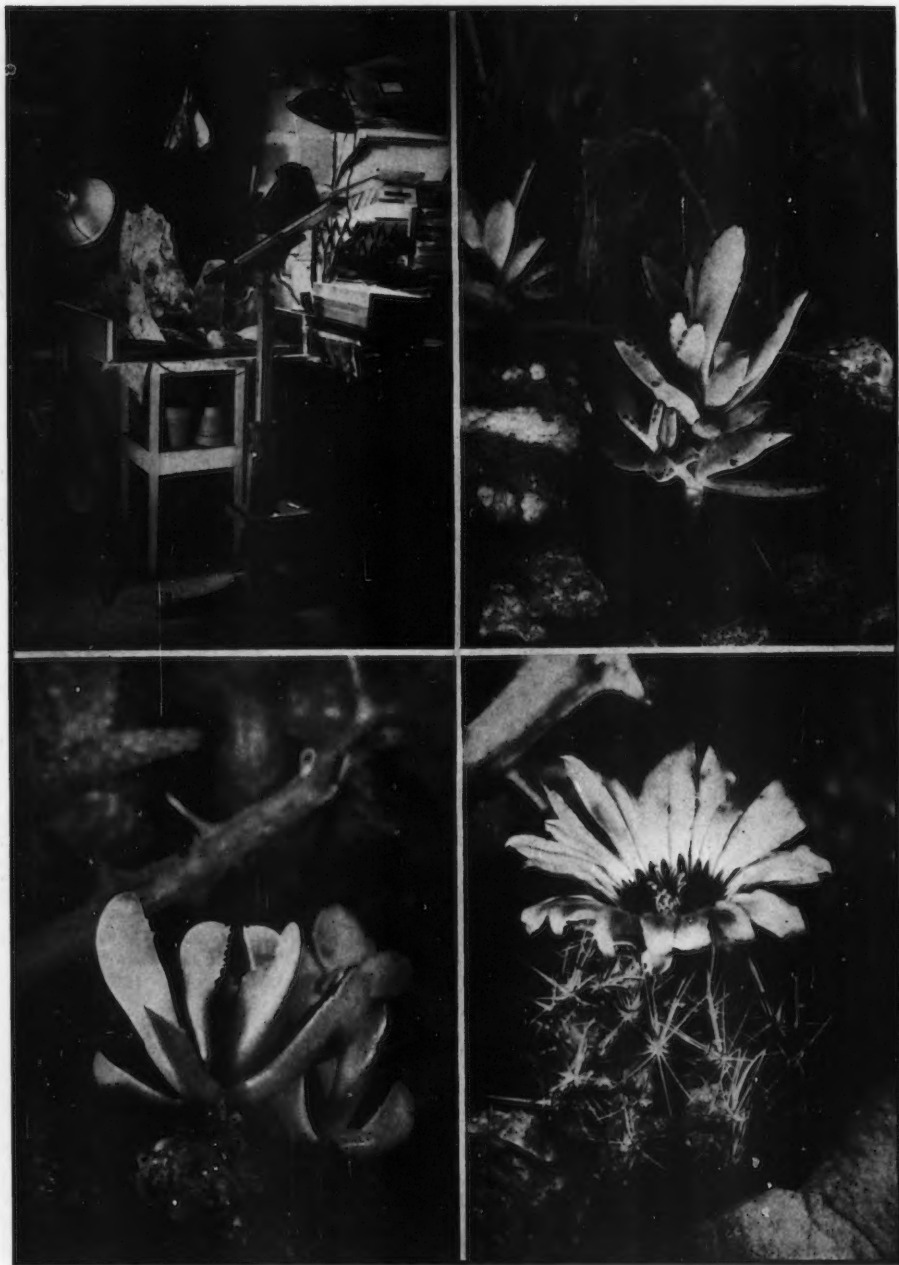
In the matter of film carriers I personally give preference to the Film Pack. Not only are they compact with one dozen films, each plainly numbered, but they have the advantage over the roll type, owing to the fact that each exposed film can be removed and developed as soon as "shot," without disturbing the unexposed films in the pack.

This individual film removal is particularly convenient when you do your own processing. Having arranged your "setting", as I will describe later, the exposure can be made and developed immediately and its quality determined before the "setting" is dismantled. I can assure you that it affords but little pleasure to arrange your subject carefully, make the exposure, and a week or so later, find, when the film is developed, that this particular negative is useless. Especially is this true of a plant in flower, where a failure often means a wait for the next flowering time, which in many instances, is a period of a year.

A fully equipped darkroom is ideal, but with a light-tight closet, a developing tank and a few bottles, one can get along very well in film developing.

A small table with a top about two feet square and of regulation height is essential. Build a shallow box about three feet square, using any suitable materials at hand. Three sides should be about ten inches high. The fourth side, or front, make about three inches high. This box with a bottom is placed upon the table and acts as a "stage" for the expression of your artistic ideas in composition, the scope of which you will find to be practically unlimited in so small an area and the results are an interesting revelation.

Your collection of plants will form the principal "props" for this so-called stage, supplemented by various and easily obtained items to complete the setting. The illustrations will in-



The "stage" and some of the "props." The camera stand is homemade and very efficient. TOP RIGHT: *Kalanchoe tomentosa*. BOTTOM LEFT: *Carruantbus canius*. BOTTOM RIGHT: *Coryphantha vivipara*.

dicating that I prefer a collection of odd shaped rocks, stones and pebbles of interesting texture and colors, bits of weathered tree roots and a few small, weathered tree stumps and some bark. The greater the range of suitable "props," the greater the scope in ever changing arrangements.

Soft wood sawdust, colored black with ordinary household fabric dyes, makes excellent material for a bed or foundation on which to build up your composition. The sawdust will have a tendency to be grayish when dry but will darken up when dampened, which also makes it possible to bank it around the pot and rocks without sliding. Sand can be employed if it has a photographic color value that will afford contrast.

With a three or four inch layer of damp sawdust in the box, the potted plant is placed in the center foreground. The camera and tripod is set, and the subject is brought into focus to a size that is consistent with your ideas. The plant should now be rotated and tilted in various angles in order to secure its most perfect form and position when viewed on the focusing glass.

The plant, adjusted to your satisfaction, is then anchored by placing rocks against the pot. The background is next undertaken, keeping in mind that the subject is the center of interest and that the background is secondary, but, nevertheless, very important in forming a pleasing picture. Keep your subject three or four inches in the front of the foremost mass of your background. As one proceeds with the arrangement it should be frequently viewed on the ground-glass, giving special attention to the contrast of the background in emphasizing the plant, especially that portion that outlines the plant.

When all is to your liking, a strip of white paper with two or three sizes of type printed sharply thereon, is placed on the plant as near to the center, from all directions, as possible and still clearly seen on the ground glass.

With all lights on, rack the lens back and forth until the type is clear and sharp. A reading glass will help to obtain a critical focus. The lights should be so arranged that one is to the front and above your "setting" to light the whole arrangement. The second light should be so adjusted that it benefits the subject. A mirror or a sheet of white cardboard will often be found useful in reflecting light into the deeper shadows.

Everything now in readiness, you find yourself faced with the problem of how much exposure and what stop to use. If you are so fortunate as to be the possessor of a Light Meter, your problem is over, as it automatically gives you both stop and time and it never guesses. The next best is to study and use the data furnished with the films. The last is by trial and error.

If you must resort to the last method (and many excellent pictures have been made by this method) I recommend the following: Assuming your film to be of the moderate fast type, but not the superspeed, place one light not over four feet away from your set-up and somewhat above to light the whole. Place the second light about three feet away from your plant and in a position where it gives the best lighting effect.

If the natural color of your plant should be on the dark side, set your stop at f-18 and the time at one second. In case the plant should be very light in its natural color, set the stop at f-22 and the time as above. Make the exposure while exercising care not to create any vibration in your camera or setup. This exposure when developed will prove to be an excellent negative to submit to a friend with photographic knowledge, or to your dealer, for their criticisms and advice.

In this particular form of photography all the important elements might be considered constant and when the time of exposure is once established, that too becomes constant, to a marked degree.

Space will not permit the discussion of filters, printing by contact and projection, but I will gladly answer any question that my cactiophile friends might desire. All illustrations herewith were made with an inexpensive camera and lens and with like "props" as herein described.

Address: Glenwood Landing, Long Island, New York.

FROM CORDOVA, ALASKA

This will acknowledge receipt of your letter of November 30, which gives the impression that you are somewhat surprised that one who lives in Alaska should make a hobby of cacti. Well, to tell you the truth, I am more or less surprised myself, and being very new at the cactus business I do not feel qualified yet to express any views concerning these interesting little plants, except to say that they have fulfilled every expectation insofar as satisfaction in growing things is concerned.

Cordova is situated on the coast of Alaska, and while we do have many bad storms and a lot of snow during the winter, our temperature never gets below zero; in fact, our climate is about the same as that of Seattle, except for the bad wind storms. Our soil is very poor, and needs a lot of fixing before it will grow the average flower or vegetable. Bulbs, however, do very well, and we always have a lot of them around our home. Our winters are rather long, with very little daylight during the December and January months, and it is this lack of light which I am afraid will "get" some of my cacti.

I first became interested in cacti last spring, when I noticed your book "Cacti for the Amateur" in a circular I had. I sent for the book and after reading it, decided that perhaps I had the necessary intelligence to collect cacti and make a success of it,—so sent for a trial order,—which so pleased me that I have been having a few plants shipped to me off and on ever since. I now have about 150 different specimens, and

have lost about five out of all I have received. Decided later to try raising some from seeds and have about a hundred little plants coming along under glass at this writing. Those I have lost have been drowned—but I really feel that I should not express myself about the success of my venture until our long winter is over, and I see just how many of my little friends have survived. If you would care to hear from me again,

say, in about June, 1940, I am sure I shall know a lot more about cacti than I do now, insofar as growing is concerned.

The kind of articles I would most like to see in your little JOURNAL is that dealing with the care of cacti in the house, as of course, we must have these little fellows in the house in this country all the time.

MRS. W. P. ROARK.



A window display of Mrs. W. T. Rowland, Dayton Beach, Florida. Note the excellent collection of healthy grafts.

A FLORIDA GROWER

I became interested in cactus and succulents about three and one-half years ago. My enthusiasm grew as did my cacti, until now I have several hundred kinds. When I subscribed for the CACTUS JOURNAL, I learned so much about those rare little prickly pests, that I became more interested.

I experimented with grafting about a year ago and was very successful. I root off-shoots, cuttings, etc., and through the insistence of many visitors, I started selling small plants and specimen plants which I have collected. I am very successful. Now I have a small greenhouse, arranged artistically, with a nice variety of plants. Many visitors view my many rock gardens set with cacti and succulents and many pictures have been taken, so I am beginning to think that some one else sees beauty in our prickly plants.

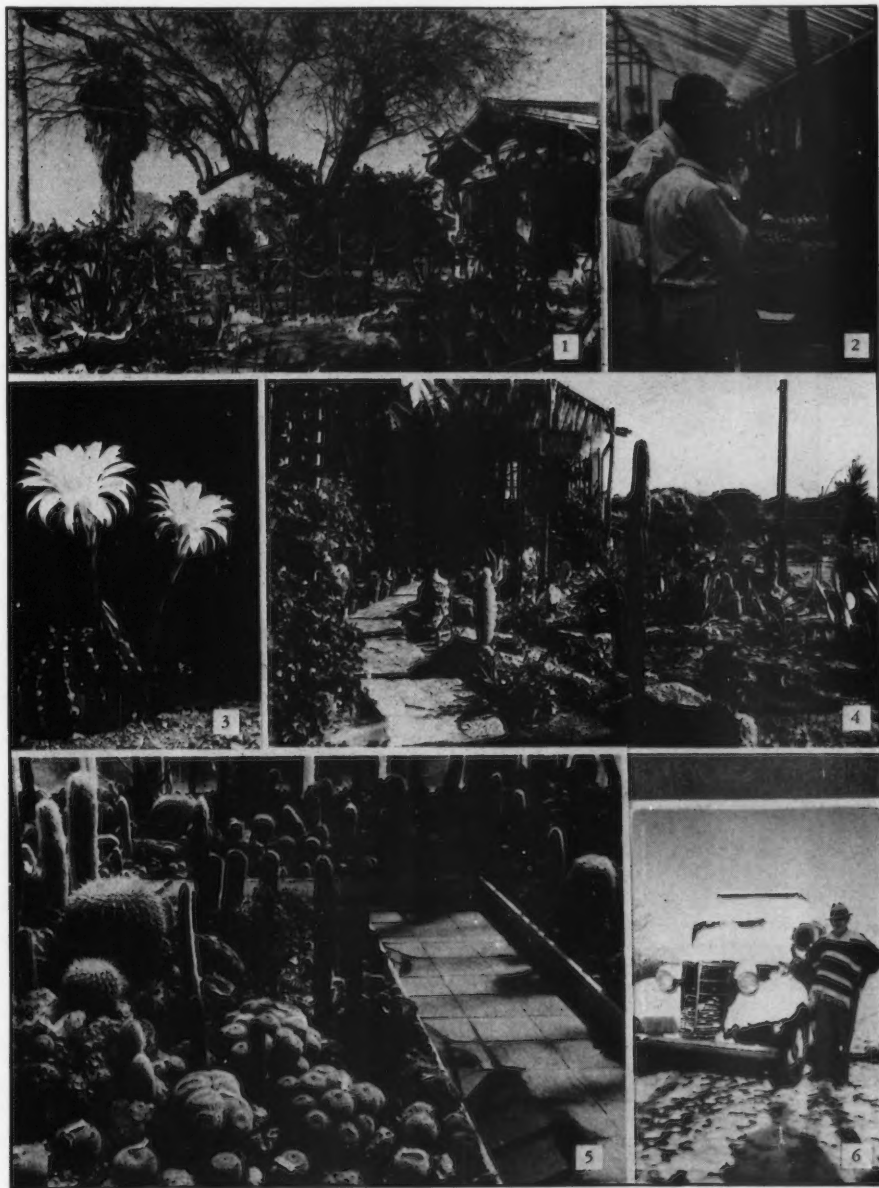
The picture does not do justice to my cacti for they do not show among the rocks (see picture on next page).

Florida, "The Land of Sunshine and Cacti" is really an ideal climate in which to grow cacti and other succulents. The cool dry winters and hot summers, with almost daily rains, is just what they seem to want. I live near the ocean, so we very seldom have frost. The rock formation in this section, a mixture of shell and sand, is ideal for cactus. It is very porous and absorbs moisture readily so cactus sink their roots deep and thrive.

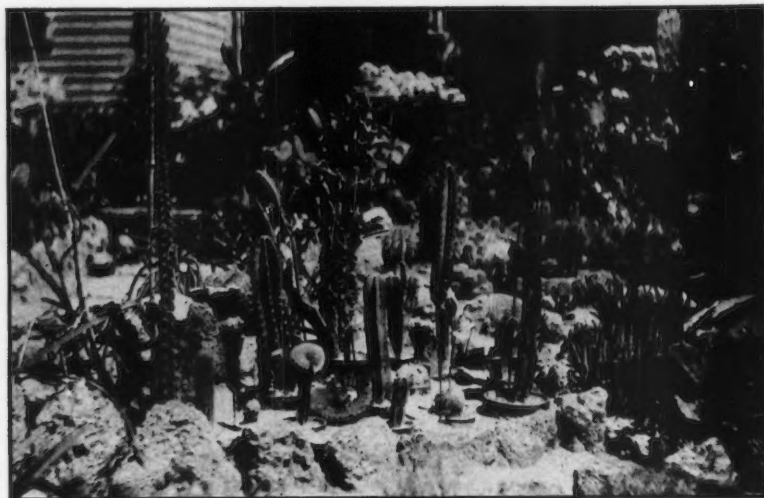
I have quite an assortment of cacti, Agaves, Aloes, Dyckias, Gasterias, Echeverias, Crassulas, etc., in my gardens. In my new greenhouse I have quite a number of beautiful specimen plants and shade-loving small grafts. That is my weakness, grafting. Just try grafting a tiny and attractive offshoot and see how quickly it starts growing, then you'll be a cactus fan for life.

A Florida Amateur Cactus Fan.

MRS. W. T. ROWLAND, Dayton Beach, Florida.



1. Fitzpatrick's Cactus Gardens in Edinburg, Texas, showing *Selenicereus* growing 15 feet into the tree. 2. Our old friend James West in the good old days (Edgar Baxter listens!). 3. The most satisfactory *Echinopsis* hybrid flowering in Phoenix for Mrs. Howard MacCallum—photo by Mrs. Proctor. 4. A garden view of Xerophyte Gardens of Mrs. Wm. Rowland, Dayton Beach, Florida. 5. A small part of Mr. Schmoll's collection in Mexico. 6. F. Radley visits the cactus country—Marathon, Texas, and finds A. R. Davis enjoying a snow storm.



Part of the author's collection in Amboy, Illinois. Note the buds on *Eriocereus bonplandii* and *E. tortuosus*

SOILS FOR CACTI

By ARTHUR BLOCHER

I realize that at the mention of the word soil among cactus collectors, especially in a group, much discussion could and would be started. Also each collector has his own mixture that he usually swears by. To us here in the "Middle West" there is still much doubt and confusion in regard to the amount of sand, proper sand and drainage. Most of the visitors to my cactus garden are highly interested in these various soils and mixtures. As our government is now taking a high interest in Soil Conservation through the CCC and especially with the Farm Bureau taking an active lead, I am sure it is an important matter, increasingly so with us Cactus Fans.

To me the word soil is not a "dirty" one but a very important one. I trace ninety per cent of failures to the lack of drainage and proper soil. To some this may seem a high percentage, but I am of the opinion that through years of experience that deaths due to rotting from rains and other causes would not have occurred with proper drainage and mixture. This little article is not to be taken as an ironclad, sure-success rule to follow. It is merely an explanation of my various successes and failures, through six years of experiments and experience. As there are so many varieties of climate, soil and weather conditions in this great country of ours, what I consider ideal here would probably not apply to those in the great Southwest or in the southern states. For three years I did not know that a Cactus Society existed or that there were books available on cacti. But as a result of the past three years' experience, since subscribing to the *Cactus Journal* and reading and studying the various books and articles, I have developed a mixture of soil that is suited to this climate and dare I say 100% perfect? Out of five hundred plants I lost four in 1939, and my opinion is that this is a record, as we have such extremes in weather.

My collection is taken outdoors as early as possible around the first of May and remains until the middle

or last of October. This collection receives no covering whatsoever. One year we may have a cold, wet spring and the next a warm dry one. We may have a wet summer and we may have a dry one. I have seen in the month of August such floods of rain as to wash out bridges, entire fields of grain, etc. The fall in 1939 was warm and abnormally dry. In 1938 we did not have a killing frost until October 30. A few years past it froze so hard September 23 that one could walk on the ice. This may not be of interest to many but my reasons for studying the weather will be revealed shortly. Several horticulturists have told me that this is one of the poorest rose-growing districts on account of the variability of the climate.

I am known as a hard loser. In athletics in school I was a hard loser and always liked to win. It is a challenge to me when I lose a cactus plant, so I always thoroughly analyze the soil and other factors involved to determine the cause. My first few years were really heartbreaking and enough to discourage any collector, as I lost fully seventy-five per cent of my collection. My first few cacti were purchased in a nearby greenhouse and as they were growing nicely in black dirt I left them. The chap informed me they would make twice the growth on good black soil as in sand and he really had a fine collection. We then had a rainy spell and away went most of my collection, including a nice *Opuntia basilaris* and *Echinocereus rigidissimus* and others.

My Rule 1 is: Prepare every plant for a rainy year and in dry years it is easy to water. In my next purchase from another dealer I was told to plant them in pure sand as they grew that way in the desert. I planted them in a pure yellow sand; they lived but grew not. Now I know that this same sand was lacking in chemical and physical elements. In one trip to the great Southwest I learned that the cacti there did not grow in pure sand. These are just a few of the obstacles and difficulties we have had to contend with.

I know we collectors owe the founders and officers of the Cactus Society a vote of thanks, as through the publication of our monthly magazine and the various books we have received much needed advice and help.

Here in this Middle West there is now much activity on farms, where soil is being tested for acidity. As a result, old stone quarries are now beehives of activity and hundreds of tons of limestone are being crushed and spread onto farms. Only two weeks ago the owner of one quarry told me one farmer alone ordered one hundred and twenty tons of limestone. Many in town are using it on their small gardens, with surprising results. I lost my first two plants of *Echinocactus horizontalis* through a lack of lime in the soil; they were planted in an acid soil. Mine are now planted in a limestone soil where they root nicely, and are strong healthy plants. *Rule 2*: On all desert species, use lime or limestone in the soil in some form.

I am quite proud of the picturesque setting of the country around my home town of Amboy. We have a great variety of soils, hills, etc. To the south are what is known as the Sandhills. These are small hills of a heavy golden sand that is not very fertile. In some hills, blowholes have developed and Indian relics have been found. To the east are some woods and many limestone quarries along Green River. To the north are the prairies with ordinary soil, also to the west. To the southwest is the extremely fertile black peat soil in what used to be known as the lower swamps, before it was tilled and drained. When freshly plowed, a field looks as though it were covered with black lump coal. Bumper crops are always raised here. One farmer in burning corn stalks set fire to his field and it burned for a year. To the south in neighboring Bureau County are to be found much timber, lime and sandstone hills. In the dry washes between these hills is to be found a coarse, porous and light sand. It is ideal, as it drains rapidly and contains some chemical elements. In the beds of these dry washes are to be found many beautiful rocks similar to a sponge. The sandstone has washed away, leaving the limestone base. Many have the imprints of leaves and are in fantastic formations. When the rock garden craze was at its height here, many came from all parts of northern Illinois, even Chicago, one hundred and twenty miles away, with trucks and hauled these rocks away. Some of the owners got on to this and soon a charge of one cent a pound was made. I hauled many loads away myself and used them in my rock and desert garden. If our genial editor can print the poor picture I am enclosing, it will give you an idea of these rocks and how I use them for borders. Also in these woods can be found from one to two inches of leafmold. This is a very poor leafmold as all our leafmold comes from oak leaves. It contains tannic acid and as a rule not even house plants thrive on it. Used alone you are sure to lose your cacti. You will say, "What has this got to do with raising cacti?"

Shall I say, in my "soil room" is where I always have the following on hand: 1 large basket full of broken crockery, 1 sack of charcoal, 1 pail of yellow sand, 2 baskets full of the coarse creek sand, a couple pails of black peat, and a couple baskets full of limestone.

Now we are ready and I shall describe my "desert mixture" first. I use 1 trowel full of black peat, 2 trowels of the coarse creek sand, 1/2 trowel each of broken plaster, charcoal and limestone. The limestone and plaster supply the lime necessary, the charcoal keeps the soil sweet, the peat supplies the organic matter necessary, the sand some mineral and the looseness necessary for drainage. This mixture does not

cake after a rainy spell, or harden, and drains readily. I do not pulverize the plaster or charcoal. In breaking it, some is pulverized but it usually runs from the size of coarse sand to marbles. To some using both the limestone and plaster, this may seem like a heavy dose of lime, but I do not agree. If I used slack lime, in a couple rains it would be washed through the soil, and if this crushed limestone is finally washed away the broken plaster will supply more. I believe I spend more time mixing this than a baker does kneading his dough. Now for a 6-inch pot I usually put in the bottom an inch of broken crockery and cover with gravel, or crushed rock. I use this mixture on all desert species, including Mexican. I also use it for *Opuntia clavata* as they rot with a heavier soil, especially *Opuntia parishii*.

For the other types of *Opuntia* such as the Prickly Pears, Chollas, etc., I use a 50-50 mixture with the same amount of limestone, plaster and charcoal. I also use this for all the *Cereus*. For *Epiphyllums* and *Echinopsis* I use 2 trowels of peat and 1 of sand. For the *Epiphyllums* I do not use any plaster or limestone but do use the charcoal. Some growers of *Epiphyllums* may not agree with me and I agree that I have much to learn, but for the past 2 years my *E. Ackermannii* has certainly had its share of beautiful blossoms. One of my plants blossomed for four months. Each *Echinopsis* tried to outdo the other in flowers and all put on a nice growth.

Now I can actually hear many of you remark, "Well, what are you going to do with that sterile, heavy yellow sand?" I usually put a half inch on top of the other soil after the plant is in its place to give all a nice appearance and it does. I would also like to give this illustration in regard to the yellow sand and lack of limestone. A few years ago I purchased a nice clump of *Echinocereus stramineus* and planted it in this pure yellow sand. It lived, but grew not and finally turned a sickly color. On transplanting it to my desert mixture, in a short time it regained its color and by fall had made a surprising growth, both in plant and spines. I use about two inches of this yellow sand to completely cover my desert garden and it certainly gives it a pleasing appearance.

For cactus seeds I use this desert mixture, place the seeds on top and cover very lightly with the porous sand and I have enjoyed excellent success—almost 100% germination and my seedlings are all strong and healthy with a good color. I have several pans full that are wintering nicely so far.

We sometimes have rainy periods here in which it will rain every day for a week or more. In the fall of 1938 it rained for nine days and was continuously cloudy. With a heavy soil, the types from the desert would rot, but I only lost one plant. By the desert types I mean *Ariocarpus*, *Astrophytum*, *Cephalocereus*, *Cereus*, *Coryphantha*, *Echinocactus*, *Echinocereus*, *Echinomastus*, *Echinofossulocactus*, *Escobaria*, *Fero-cactus*, *Mammillaria*, *Neolloydia*, *Neobesseya*, the *Opuntias* mentioned, *Lophophora williamsii*, etc. I am sure this will give you a fair idea. I repeat again if we have a wet spell and we do, the plants all have a good drainage. If we have a dry spell it is easy to water them. My collection is now healthy, full of color, solid, and excellent spine growth. I have had a continuity of blossoms from the first of April until into November. One of the biggest "kicks" or "thrills" I get from my collection is potting plants, so my rule would read—a rich, porous soil that drains readily. I hope this will help some others and in closing hope to learn as much in the next six years as I have in the past six years.

PROF. ARTHUR BLOCHER, Amboy, Illinois.

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Correction: *Cleistocactus vaupelii* in April JOURNAL should have read, *Cleistocactus baumanni*.

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MATUCANA: Haynii.

MELOCACTUS: Peruvianus, Townsendianus.

MILA: Caespitosa, Nealeana.

MORAWETZIA: Doelziana.

NEORAIMONDIA: Macroctibus.

OREOCEREUS: Celsianus, Fossulatus, Hendricksenianus, Trollii.

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